AMENDMENTS TO THE SPECIFICATION

Please replace the paragraphs beginning at page 3, line 18 that end at page 6, line 19 with the following rewritten paragraphs:

-- ~~By the way, in a patent document 1~~ By way of further background, ~~(~~Japanese Patent Laid-Open Publication No. 188495/2003~~),~~ (JP '495) ~~there is disclosed an invention of~~discloses a process for producing a printed wiring board comprising subjecting a metal coated polyimide film, which has a first metal layer formed on a polyimide film by a dry film-forming method and a second metal layer having conductivity that is formed by plating on the first metal layer, to etching to form a pattern, wherein after the etching, the etched surface is subjected to cleaning treatment with an oxidizing agent. In Example 5 of ~~this patent document 1~~JP '495, an example comprising plasma depositing a nickel-chromium alloy in a thickness of 10 nm and then depositing copper in a thickness of 8 μm by plating is shown.

~~In the process described in the patent document 1, it is described~~ JP '495 further discloses that after the pattern is formed by etching, the first metal layer present on the surface of the polyimide resin film is treated with an oxidizing agent. In such a treatment using an oxidizing agent, however, a considerable amount of the first metal remains, and passivation thereof is not carried out completely, so that in severe environments short-circuit or the like sometimes occurs in a relatively short period of time. Further, the metal that forms the first metal layer in ~~the patent document 1~~JP '495 is all treated with an oxidizing agent, but a part of the metal is hardly oxidized, and in this case, there is a possibility that favorable insulation is ~~nor~~not formed between wiring patterns. In the treatment adopted in ~~the patent document 1~~JP '495, moreover, a trace amount of a metal remaining is hardly passivated. Therefore, after a voltage is continuously applied for, for example, 1000 hours or more, the value of insulation resistance between wiring patterns tends to become lower than that before the application of a voltage though the value of insulation resistance is favorable immediately after the production.

~~In paragraphs~~Paragraphs [0004] and [0005] of ~~a patent document 2 (~~Japanese Patent Laid-Open Publication No. 282651/2003~~),~~JP '651 ~~it is described~~discloses that a metal layer 1 made of an alloy of copper and a metal other than copper is provided on a surface of a

flexible insulating film 2 in order to ensure adhesion strength between the flexible insulating film and a wiring pattern, then on a surface of the metal layer 1 a copper foil is arranged to form a composite, and from the composite a flexible wiring board is produced. ~~It is~~JP '651 further ~~described~~describes that at the peripheral lower part of the lead of the wiring pattern formed by the use of such a composite, the metal layer 1 remains as an unremoved part as shown in Fig. 5 of JP '651, and ~~it is also described~~further discloses that because of the unremoved part, abnormal deposition 6 of the plating metal takes place. Moreover, ~~it is described~~JP '651 further discloses that at the place of the abnormal deposition 6 of the plating metal, a crystal of tin grows and becomes a "whisker", and because of the whisker, a short-circuit takes place in the wiring pattern. That is to say, if the metal layer 1 provided to ensure adhesion strength of the wiring pattern is left as it is and if a tin plating layer is formed on the surface of the metal layer 1, a whisker is generated from the thus formed tin plating layer. In ~~the patent document 2~~JP '651, therefore, the metal layer 1 is completely removed as described in ~~a~~paragraph [0023] thereof.

However, it is extremely difficult to completely remove the metal layer 1 from the outer periphery of the wiring pattern. In the process described in ~~the patent document 2~~JP '651, the metal layer 1 remains as it is at the lower part of the outer periphery of the wiring pattern though the amount is small, and generation of whiskers from the tin plating layer attributable to the residual metal layer 1 cannot be completely prevented.

~~Patent document 1: Japanese Patent Laid-Open Publication No. 188495/2003~~

~~Patent document 2: Japanese Patent Laid-Open Publication No. 282651/2003~~ --

Please replace the section heading at page 6, line 21 with the following rewritten section heading:

-- ~~DISCLOSURE~~SUMMARY OF THE INVENTION --

Please DELETE the section heading at page 6, line 22.

Please DELETE the section heading at page 8, line 1.

Please DELETE the section heading at page 10, line 22.

Please replace the paragraphs beginning at page 12, line 5 and ending on page 13, line 12 with the following rewritten paragraphs:

-- ~~Fig. 1 is~~Figs. 1(a) - (g) are a group of views showing sections of boards in a process for producing a printed wiring board of the present invention~~.~~;

~~Fig. 2 is~~Figs. 2(a) - (f) are a group of views showing sections of boards in a process for producing a printed wiring board of the present invention~~.~~;

Fig. 3 is a view of a desired wiring pattern formed by selectively etching a copper layer~~.~~;

Fig. 4 is a view of a desired wiring pattern formed by selectively etching a copper layer~~.~~;

Fig. 5 is a sectional view of a wiring pattern formed by removing a base metal layer and then performing microethcing~~.~~;

Fig. 6 is a sectional view of a wiring pattern formed by removing a base metal layer and then performing microethcing~~.~~;

Fig. 7 is a SEM photograph of a wiring pattern formed in a printed wiring board of the present invention~~.~~; and

Fig. 8 is an ~~explanatory view to explain~~perspective drawing of the SEM photograph of Fig. 7.

~~Description of numerals~~

~~11: insulating film~~

~~13: base metal layer (first metal layer, seed layer)~~

~~15: sputtering copper layer~~

~~17: plating conductive metal layer (the other conductive metal layer)~~

~~20: conductive metal layer (copper layer)~~

~~22: desired pattern composed of photosensitive resin~~

~~23: side of base metal layer~~

~~25: lower end of conductive metal layer~~

~~26: upper end of base metal layer (Ni-Cr alloy protrusion part)~~ --

Please replace the section heading at page 13, line 14 with the following rewritten section heading:

-- ~~BEST MODE FOR CARRYING OUT~~DETAILED DESCRIPTION OF THE INVENTION --

Please replace the paragraph beginning at page 13, line 21 and ending on page 14, line 6 with the following rewritten paragraph:

-- As shown in Fig. 1 and Fig. 2, in the process for producing a printed wiring board of the invention, a film in which a metal layer consisting of a base metal layer ~~12~~13 and a conductive metal layer 20 is formed on at least one surface of an insulating film is used as a base film, and the metal layer formed on the insulating film surface is selectively etched to form a wiring pattern. This metal layer may be formed on one surface of the insulating film or may be formed on both surfaces of the insulating film. --

Please replace the paragraphs beginning at page 19, line 1 and ending on page 20, line 15 with the following rewritten paragraphs:

-- After the conductive metal layer 20 is formed as above, the surface of the conductive metal of the conductive metal layer 20 is coated with a photosensitive resin, and the photosensitive resin is exposed to light and developed to form a desired pattern 22 made of the photosensitive resin as shown Fig. 1(e) and Fig. 2~~(e)~~(d). As the photosensitive resin, a photosensitive resin of such a type as is cured by irradiation with light may be employed, or a photosensitive resin of such a type as is softened by irradiation with light may be employed.

By the use of the pattern 22 formed from the photosensitive resin as a masking material, the conductive metal layer 22 is selectively etched to form a desired pattern, as shown in Fig. 1(f), Fig. 2~~(f)~~(e), Fig. 3 and Fig. 4.

The etching agent used herein is an agent for etching the conductive metal, particularly copper, and examples of such conductive metal etching agents include an etching solution containing ferric chloride as a major ingredient, an etching solution containing cupric chloride as a major ingredient, and an etching solution of sulfuric acid + hydrogen peroxide. The etching solution for the conductive metal can etch the conductive metal layer 20 with excellent selectivity to form a wiring pattern, and moreover, it has a considerable etching function for the base metal present between the conductive metal layer 20 and the insulating film 11. Therefore, when etching is carried out using the above-mentioned conductive metal etching agent, the base metal layer 13 can be etched to such an extent that the base metal layer remains as an extremely thin layer of about several nm on the surface of the insulating film 11, as shown in Fig. 1(f), Fig. 2~~(f)~~(e), Fig. 3 and Fig. 4. That is to say, the thickness of the base metal layer at the periphery of the wiring pattern formed from a conductive metal is almost the same as that of the base metal layer present below the

conductive metal, while the base metal layer becomes an extremely thin layer between the wiring patterns, as shown in Fig. 3 and Fig. 4. --

Please replace the paragraph beginning at page 21, line 17 and ending on page 22, line 20 with the following rewritten paragraph:

-- In the present invention, after the conductive metal 20 is selectively etched as above, microetching is carried out, and then, the base metal layer 13 is treated with a treating liquid capable of dissolving and/or passivating the metal that forms the base metal layer 13, as shown in Fig. 1(g), Fig. 2~~(g)~~(f), Fig. 5 and Fig. 6. The base metal layer 13 is formed by using copper, nickel, chromium, molybdenum, titanium, vanadium, iron, cobalt, aluminum, zinc, tin and tantalum singly or in combination. In the present invention, the base metal layer is treated with a treating liquid capable of dissolving and/or passivating these metals. For example, in the case where the base metal layer is formed by using nickel and chromium, a sulfuric acid/hydrochloric acid mixed solution having each concentration of about 5 to 15% by weight can be used for nickel, and an aqueous solution of potassium permanganate + KOH, an aqueous solution of potassium bichromate or an aqueous solution of sodium permanganate + KOH can be used for chromium. When the aqueous solution of potassium permanganate + KOH is used in the invention, the concentration of potassium permanganate is in the range of usually 10 to 60 g/liter, preferably 25 to 55 g/liter, and the concentration of KOH is in the range of usually 10 to 30 g/liter. In the present invention, the temperature for the treatment using such a liquid is in the range of usually 40 to 70°C, and the treating time is in the range of usually 10 to 60 seconds. --

Please replace the paragraph at page 23, line 13 with the following rewritten paragraph:

-- By the use of a treating liquid corresponding to the metal(s) for forming the base metal layer 13, the base metal layer 13 present on the insulating film 11 is removed or passivated, as shown in Fig. 1(g), Fig. 2~~(g)~~(f), Fig. 5 and Fig. 6. Through this step, therefore, the wiring patterns formed become electrically independent from one another. By such a treatment, further, a side end 23 of the base metal layer 13 laminated on the insulating film is passivated, so that occurrence of migration from the side end 23 of the base metal layer 13 can be prevented. --

Please DELETE the section heading at page 45, line 1.